

AMENDMENT UNDER 37 C.F.R. § 1.111
U.S. Patent Application No. 10/004,423

REMARKS

Reconsideration and allowance of the subject application are respectfully requested.

Upon entry of this Amendment, claims 1-14 are pending in the application. In response to the Office Action (Paper No. 4), Applicant respectfully submits that the pending claims define patentable subject matter. By this Amendment, Applicant has amended claims 1, 2, 4, 5, 12 and 13 to improve clarity.

As a preliminary matter, Applicant thanks the Examiner for indicating that claims 2-5 and 8-11 would be allowable if rewritten in independent form. However, Applicant respectfully requests the Examiner to hold in abeyance the rewriting of these claims until the Examiner has had the opportunity to reconsider the rejected parent claims in light of the arguments presented below in support of the Applicant's traverse of the rejection.

I. Rejection of claims under 35 U.S.C. § 112, first paragraph

Claim 1 is rejected under 35 U.S.C. § 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventors, at the time the application was filed, had possession of the claimed invention. In particular, the Examiner asserts that “[n]either the specification nor the claim clearly convey to the examiner as to what Address 1 to Address m may be.” The Examiner further indicates that “clarification is requested” regarding the claimed phrase “housing positions from Address 1 to Address m ($m \geq 4$).”

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As indicated in the specification at page 27, lines 2-4 (with reference to Figures 1-5), “the positions in each of the slots 15a in which the conductor segments 30 are housed are designated Address 1, Address 2, Address 3, and Address 4, respectively, from an inner circumferential side.” Thus, with regards to claim 1, the address designation “Address 1 to Address m ($m \geq 4$)” is utilized to indicate a location of each of the housing positions from the inner circumferential side to the outer circumferential side in each of the slots, wherein the total number of the housing positions in each of the slots is greater than or equal to four (i.e., if $m = 4$, as in the example utilized in the specification, then the four housing positions are designated by Address 1, Address 2, Address 3, and Address 4).

Nonetheless, by this Amendment, Applicant has amended claim 1 to improve clarity by reciting that the “slot-housed portions [are] housed in a plurality of housing positions of said slots so as to be lined up in one row from an inner circumferential side to an outer circumferential side in each of said slots, wherein each of said housing positions is designated by a corresponding address indicating a location of each of said housing positions from said inner circumferential side to said outer circumferential side in each of said slots, and the total number of said housing positions in each of said slots is greater than or equal to four.”

Accordingly, the Examiner is requested to remove the § 112, first paragraph, rejection of record.

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II. Prior Art Rejection of Claims 1, 6, 7 and 12-14

Claims 1, 6, 7 and 12-14 are rejected under 35 U.S.C. § 103(a) as being unpatentable of Umeda et al. (U.S. Patent No. 6,388,358; hereafter “Umeda ‘358”) in view of Umeda et al. (U.S. Patent No. 6,181,045; hereafter “Umeda ‘045”). Applicant respectfully traverses the § 103 rejection.

Independent claim 1 recites a “stator winding comprising a plurality of winding sub-portions, each of said winding sub-portions comprising ... coil ends in which said slot-housed portions housed in different addresses in said slots in each slot pair separated by a predetermined number of slots are connected in series outside said slots.” Claim 1 further recites that the coil ends include (1) “distant-address joint portions in which said slot-housed portions housed in addresses separated by at least three addresses in said slots in said each slot pair are joined together outside said slots”, and (2) “near-address joint portions in which said slot-housed portions housed in addresses separated by less than three addresses in said slots in said each slot pair are joined together outside said slots.”

For example, as shown in Figures 1-5 and described in the specification on pages 27-29 with regards to the first embodiment of the present invention, the free end portions 30c of the conductor segments 30 extending outward at the rear end from Address 1 in slot 15a (Number n) and the free end portions 30c of the conductor segments 30 extending outward at the rear end from Address 4 in slot 15a (Number n+6) are stacked in a radial direction and joined, for example, by welding. Similarly, the free end portions 30c of the conductor segments 30 extending outward at the rear end from Address 2 in slot 15a (Number n) and the free end

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portions 30c of the conductor segments 30 extending outward at the rear end from Address 3 in slot 15a (Number n+6) are stacked in a radial direction and joined, for example, by welding, so as to be offset in a circumferential direction relative to a joint portion 31 joining the free end portions 30c of the conductor segments 30 extending outward at the rear end from Address 1 and Address 4. Thus, two two-turn lap windings 29 each functioning as a winding sub-portion are formed, the lap windings being wound into every sixth slot 15a.

Umeda '358 (Figures 2, 3 and 5) discloses that conductor segments 331 are inserted into slots 35 such that the straight portions 331a and 331b of the conductor segments 331 are housed in an innermost layer (Address 1) and an outermost layer (Address 4) of each slot 35, respectively. Conductor segments 332 are inserted into the slots 35 such that the straight portions 332a and 332b of the conductor segments 332 are housed in the inner-middle layer (Address 2) and the outer-middle layer (Address 3) of each slot, respectively. Connection (end) portions 331e and 332e of the conductor segments 331 and 332 extending from the outermost and outer-middle layers (Addresses 4 and 3) are electrically connected and connection (end) portions 332d and 331d of the conductor segments 331 and 332 extending from the inner-middle and innermost layers (Addresses 2 and 1) are electrically connected.

Similarly, Umeda '045 teaches insertion and connection of the conductor segments in the same manner as Umeda '358 (see Figures 8-12 of Umeda '045).

Accordingly, Applicant respectfully submits that Umeda '358 and Umeda '045 do not teach or suggest "distant-address joint portions in which said slot-housed portions housed in addresses separated by at least three addresses in said slots in said each slot pair are joined

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together outside said slots”, as required by claim 1. Rather, the cited references teach that the end portions of the conductor segments extending from adjacent slot addresses (Addresses 1 and 2, and Addresses 3 and 4) are connected (i.e., the joint portions in which the slot-housed portions housed in adjacent addresses in the slots in each slot pair are joined together outside the slots).

Further, Applicant respectfully submits that Umeda '358 and Umeda '045 do not teach or suggest that “said distant-address joint portions are disposed so as to be separated in a circumferential direction relative to said near-address joint portions”, as required by claim 1. For example, as shown in Figure 4 of the present application, the distant-address joint portions 31₁₋₄ and the near-address joint portions 31₂₋₃ are alternately arranged in a circumferential direction. On the other hand, Umeda '358 (Figure 5) and Umeda '045 (Figure 12) teach that joint portions connecting the conductor segment ends are lined up in the circumferential direction.

Accordingly, Applicant respectfully submits that independent claim 1, as well as dependent claims 6, 7 and 12-14, would not have been rendered obvious in view of Umeda '358 and Umeda '045 because the combined references do not teach or suggest all of the features of the claims.

III. Conclusion

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

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The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,



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PATENT TRADEMARK OFFICE

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APPENDIX
VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS:

The claims are amended as follows:

1. (Amended) A stator for a dynamoelectric machine comprising:

an annular stator core in which a plurality of slots extending axially are disposed in a circumferential direction; and

a stator winding installed in said slots, said stator winding [being provided with]
comprising a plurality of winding sub-portions, each of said winding sub-portions comprising:

slot-housed portions housed in a plurality of housing positions [from Address 1 to Address m ($m \geq 4$)] of said slots so as to be lined up in one row from an inner circumferential side to an outer circumferential side in each of said slots, wherein each of said housing positions is designated by a corresponding address indicating a location of each of said housing positions from said inner circumferential side to said outer circumferential side in each of said slots, and the total number of said housing positions in each of said slots is greater than or equal to four; and

coil ends in which said slot-housed portions housed in different addresses in said slots in each slot pair separated by a predetermined number of slots are connected in series outside said slots, said coil ends including:

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distant-address joint portions in which said slot-housed portions housed in addresses separated by at least three [or more] addresses in said slots in said each slot pair are joined together outside said slots; and

near-address joint portions in which said slot-housed portions housed in addresses separated by [two or] less than three addresses in said slots in said each slot pair are joined together outside said slots,

wherein said distant-address joint portions are disposed so as to be separated in a circumferential direction relative to said near-address joint portions.

2. (Amended) The stator for a dynamoelectric machine according to Claim 1 wherein each of said winding sub-portions [is constructed by inserting] comprises a plurality of conductor segments inserted into different addresses in said slots in said each slot pair, said conductor segments [each being formed into] having a U shape, and joining together free end portions of different conductor segments among said conductor segments extending outward from said slots from different addresses in said slots in said each slot pair,

joint portions joining together said free end portions of said conductor segments being constituted by said distant-address joint portions and said near-address joint portions.

4. (Amended) The stator for a dynamoelectric machine according to Claim 1 wherein each of said winding sub-portions [is constructed by installing one] comprises a single

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continuous conductor wire installed so as to occupy different addresses in said slots at intervals of said predetermined number of slots,

 said coil ends [being constituted by] comprising:

 turn portions of said continuous conductor wires in which different slot-housed portions among said slot-housed portions in said slots in said each slot pair are linked outside said slots;
 and

 joint portions joining together end portions of said continuous conductor wires in which different slot-housed portions among said slot-housed portions in said slots in said each slot pair are linked outside said slots,

 said joint portions joining together said end portions of said continuous conductor wires being constituted by said distant-address joint portions and said near-address joint portions.

5. (Amended) The stator for a dynamoelectric machine according to Claim 4 wherein said plurality of winding sub-portions are constructed by installing winding assemblies in said stator core so as to be stacked in at least two [or more] layers in a slot depth direction, said winding assemblies each being formed by simultaneously folding a plurality of said continuous conductor wires, and

 wherein each of said winding assemblies is constructed by arranging continuous conductor wire pairs equivalent in number to said predetermined number of slots so as to be offset by a pitch of one slot from each other, each of said continuous conductor wire pairs being

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composed of two of said continuous conductor wires arranged so as to be offset from each other by a pitch equivalent to said predetermined number of slots and so as to stack said slot-housed portions in said slot depth direction, and said two continuous conductor wires each being formed into a pattern in which said slot-housed portions are arranged at a pitch equivalent to said predetermined number of slots and adjacent pairs of said slot-housed portions linked by said turn portions are offset so as to alternately occupy different addresses in said slots.

12. (Amended) The stator for a dynamoelectric machine according to Claim 1 wherein each of said distant-address joint [portion is formed by directly joining together] portions comprises extending portions of said slot-housed portions which are directly joined together.

13. (Amended) The stator for a dynamoelectric machine according to Claim 1 wherein each of said distant-address joint [portion is formed by joining together] portions comprises extending portions of said slot-housed portions joined together by means of a metal connection portion.